

AD-A081 054

FOREST PRODUCTS LAB MADISON WI  
HARDBOARD AND INSULATION BOARD PLANTS IN THE UNITED STATES-CAPA--ETC(U)  
1979 D B MCKEEVER

F/8 11/12

UNCLASSIFIED FSRB-FPL-7

NL

1 OF 1  
40 MARCH 1980

END  
DATE  
FILED  
3-80

00

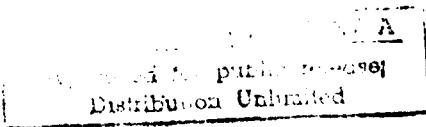
United States  
Department of  
Agriculture  
Forest Service  
Forest  
Products  
Laboratory  
Resource  
Bulletin  
FPL 7  
1979

Hardboard and Insulation  
Board Plants in the  
United States—  
Capacity, Production, and  
Raw Material Requirements,  
1955-1978

ADA081654



FILE COPY  
100



8 2 19 058

## Abstract

This report provides estimates of plant capacities for hardboard and insulation board plants in the United States in 1978. The location, type, and estimated capacity of each plant is enumerated. Industry capacity and production for 1955, 1960, 1965, 1970, 1976, and 1978 are compared. Imports and exports from 1955 and raw material requirements in 1976 are also reported.

## Definitions of Terms

### Structural Insulating Board

A generic term for a homogeneous panel made from lignocellulosic fibers (usually wood or cane) characterized by an integral bond produced by interfeiting of the fibers, to which other materials may have been added during manufacture to improve certain properties, but which has not been consolidated under heat and pressure as a separate stage in manufacture, said board having a density of less than 31 lb/ft<sup>3</sup> (specific gravity 0.50) but having a density of more than 10 lb/ft<sup>3</sup> (specific gravity 0.16).

### Hardboard

A generic term for a panel manufactured primarily from interfeited lignocellulosic fibers (usually wood), consolidated under heat and pressure in a hot-press to density of 31 lb/ft<sup>3</sup> (specific gravity 0.50) or greater, and to which other materials may have been added during manufacture to improve certain properties.

From the American Society for Testing and Materials.

## Highlights and Expectations

### Hardboard Industry

In 1978, the 28 hardboard plants in the United States had a combined annual capacity of 7.9 billion square feet ( $\frac{1}{2}$ -inch basis), over 4 times the 1955 capacity.

Since 1955, the number of hardboard plants has more than doubled.

Hardboard production has averaged approximately 80 percent of capacity since 1955.

Imports of hardboard are expected to return to the strong position experienced throughout the 1960's and early 1970's. Exports of hardboard have traditionally been of little importance and are not expected to change.

No dramatic changes are expected in the hardboard industry in the near future. Moderate increases in capacity and production following historical trends are expected.

### Insulation Board Industry

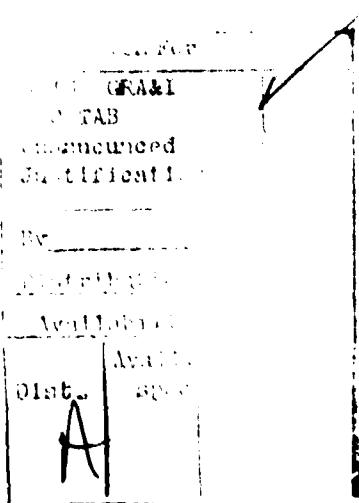
Insulation board capacity has changed very little since 1955, standing at an estimated 4.5 billion square feet ( $\frac{1}{2}$ -inch basis) in 1978, an increase of 50 percent.

The number of fiber-based insulation board plants since 1955 has increased by only 4 to 24 in 1978.

Insulation board production has averaged approximately 85 percent of capacity since 1955.

Imports and exports of insulation board have traditionally been of little importance and are not expected to change.

Competition from the new styrofoam sheathing boards are resulting in a decrease in demand for insulation board sheathing, which represents some 65 percent of the industry's output. This could be especially harmful to the industry if building codes are altered to favor these newer, better insulating styrofoam boards.



(14) FSRB-FPL-1

(11) 1979

# (6) Hardboard and Insulation Board Plants in the United States—Capacity, Production, and Raw Material Requirements, 1955-1978.

(10) By DAVID B. MCKEEVER Research Forester

(12) 16 ✓

(9) Forest Service Resource bulletins

## Introduction

Hardboard and structural insulating board are the generic terms applied to the two types of fibrous-felted boards currently classified by the American Society for Testing and Materials (ASTM) (3). The definitions of hardboard and insulation board (3,4) are given on the inside front cover of this report.

This report provides estimates of hardboard and insulation board plant capacities for 1978 as well as industry capacity and production for the years 1955, 1960, 1965, 1970, 1976, and 1978. Imports and exports of hardboard and insulation board, as well as raw material requirements, are also discussed.

Capacity is defined here as the square foot quantity of hardboard ( $\frac{1}{4}$ -inch basis) or insulation board ( $\frac{1}{2}$ -inch basis) that can be produced under normal operating conditions with continuous shifts 24 hours a day during a production year of approximately 350 days per year.

## Hardboard Industry

In 1972, the latest year for which detailed hardboard product data is available, approximately 65 percent of the hardboard produced in the United States was used for prefinished paneling—including siding and wall panels (table 1). One third of this was processed by secondary manufacturers who purchased unfinished panel stock. Nearly 25 percent of the hardboard

produced was used for dimension stock and parts, including cut-to-size and molded products, 8 percent went into other fabricated products and 2 percent was used as perforated board.

### Plant Capacity and Production Trends

In 1978 there were 28 active hardboard plants in the United States (tables 2 and 3, fig. 1). This includes seven establishments that produced both hardboard and insulation board. The 28 hardboard plants had a combined annual capacity of 7.9 billion square feet ( $\frac{1}{4}$ -inch basis) and averaged 285 million square feet of capacity per plant. The average capacity of 285 million square feet is somewhat deceiving because one plant, the Masonite Corporation plant in Laurel, Mississippi, had an estimated 1978 capacity of nearly 2 billion square feet, or 23 percent of the total hardboard industry capacity (table 4). When the Laurel, Miss., plant is excluded from the industry totals, average hardboard plant capacity decreases to 227 million square feet ( $\frac{1}{4}$ -inch basis) per year.

The total number of plants producing hardboard in the United States increased from 13 plants in 1955 to 28 plants in 1978 (table 2, fig. 1). Hardboard capacity increased fourfold during the same period of time, from 1.9 billion square feet ( $\frac{1}{4}$ -inch basis) in 1955 to 7.9 billion in 1978 (fig. 2). This represents a 6.4 percent per year average increase. Average plant size nearly doubled during the 23 year period.

Production of hardboard has been traditionally below capacity, except for brief periods of strong demand (fig. 3). In 1978, total hardboard production in

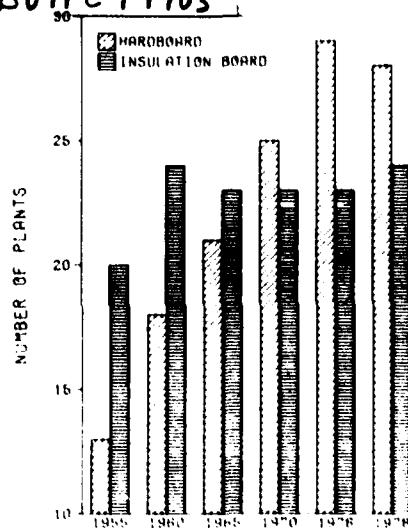


Figure 1—Number of hardboard and insulation board plants in the United States, 1955-1978 (M 148 145)

the United States was estimated to be 7.2 billion square feet ( $\frac{1}{4}$ -inch basis), 90 percent of industry capacity (table 5). Over the 23-year period, 1955 through 1978, hardboard production averaged 82 percent of capacity. The growth in production over this period averaged 7.2 percent per year, slightly higher than the 6.4 percent average annual growth in capacity. Production of hardboard in million square feet and tons per year is shown in table 6.

Individual plant locations and capacities are shown in table 4 and the map at the end of the report.

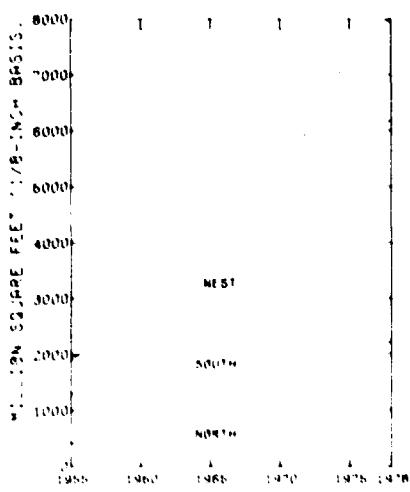
### Regional Capacity

The South has traditionally led all regions in hardboard capacity, both

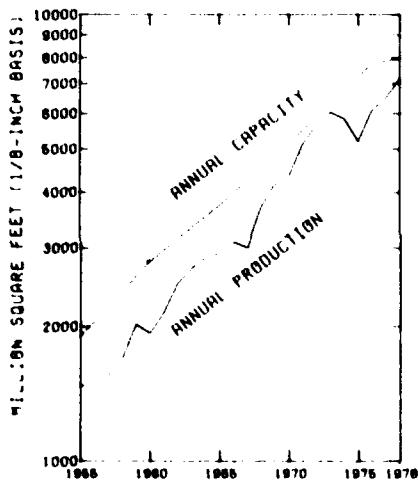
Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

Underlined numbers in parentheses refer to literature cited at the end of this report.

141700

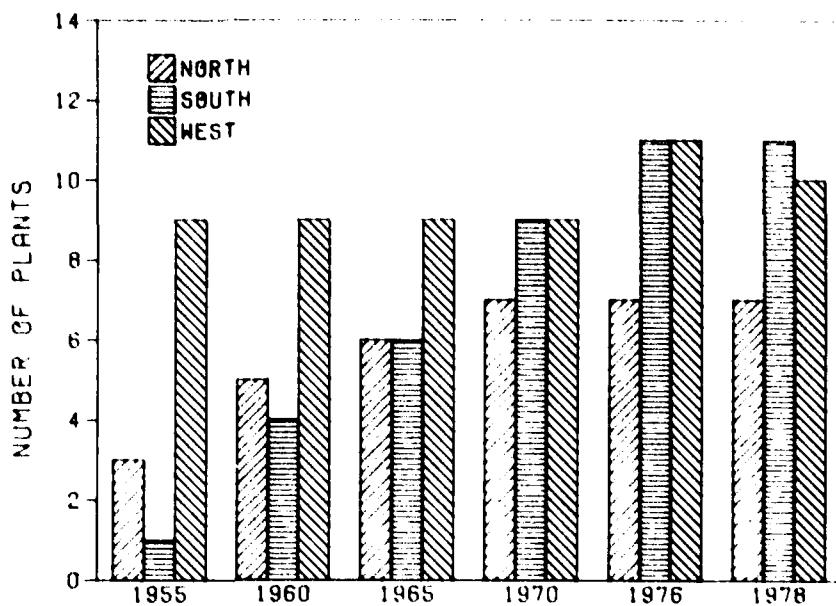


**Figure 2 —Cumulative hardboard capacity in the United States, by region, 1955-1978**  
(M 148 146)



**Figure 3 —Annual capacity and annual production of hardboard in the United States, 1955-1978.**  
(M 148 147)

total capacity and average per-plant capacity (tables 2 and 3, fig. 2). This can be attributed mainly to the Masonite Corporation plant in Laurel, Miss. In 1978, the South had a capacity of nearly 4.0 billion square feet ( $\frac{1}{8}$ -inch basis), followed by the North at 2.2 billion square feet and the West at 1.8 billion square feet. The West has, throughout the years, had more but much smaller plants than any other region (fig. 4). The North currently has fewer plants than any other region. In terms of growth in capacity, the North led all regions from 1955 through 1978, increasing capacity at an average rate of 7.7 percent per



**Figure 4 —Number of hardboard plants in the United States, by region, 1955-1978**  
(M 148 148)

year, 1.3 percent faster than the national average. The South increased capacity at an average rate of 6.8 percent per year, while the West increased capacity at only 4.6 percent per year, 1.8 percent below the national average.

#### Projected Annual Capacity

Projections of annual hardboard and insulation board capacity made by the American Paper Institute (2) based on announced alterations to plants and equipment show little change through 1980. Hardboard capacity increases of 31 thousand tons, or approximately 90 thousand square feet ( $\frac{1}{8}$ -in. basis), between 1978 and 1980 are expected. This represents only a 0.5 percent per year increase.

#### Imports and Exports

Imported hardboard has historically contributed significantly to total United States consumption. In 1955, 55 thousand tons (10 percent of domestic production) of hardboard was imported (table 7). Overall, the volume of hardboard steadily increased throughout the 1960's and into the 1970's, peaking at nearly 370 thousand tons in 1972 and 1973, just under 20 percent of domestic production. During the recession years of 1974-1975, the volume of imports dropped dramatically. In 1975 only 95 thousand tons were imported, just 5 percent of

domestic production. In 1978, imports are expected to reach 250 thousand tons, 10 percent of production.

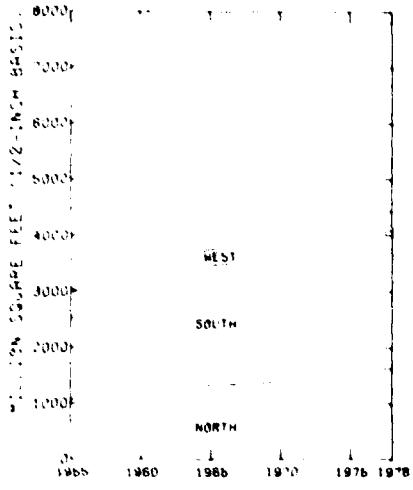
The exportation of hardboard has never been very great. In 1955, 6 thousand tons, 1 percent of domestic production, was shipped to foreign markets (table 7). In 1978 an estimated 55 thousand tons or 2 percent of domestic production was exported.

#### Insulation Board Industry

The major use for insulation board in 1976 was for exterior products, including sheathing, shingle backer, and roof decking. Fifty-three percent of all production went into these products (table 1). Interior products such as building board, wall board, sound-deadening board, and acoustical and nonacoustical tiles accounted for 34 percent of production and 13 percent of total production went for other industrial uses.

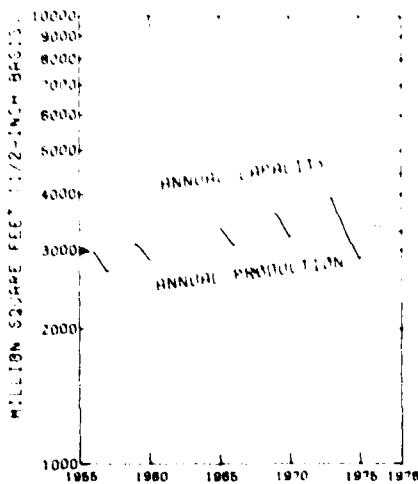
#### Plant Capacity and Production Trends

In 1978 there were 24 active fiber-based insulation board plants in the United States (tables 2 and 3, fig. 1). This includes seven establishments capable of producing both hardboard and insulation board. The fiber-based insulation board industry in 1978 had a total annual capacity of 4.5 billion square feet ( $\frac{1}{8}$ -inch basis) and averaged 186 million square feet of capacity per plant.



**Figure 5—Cumulative insulation board capacity in the United States, by region, 1955-1978**

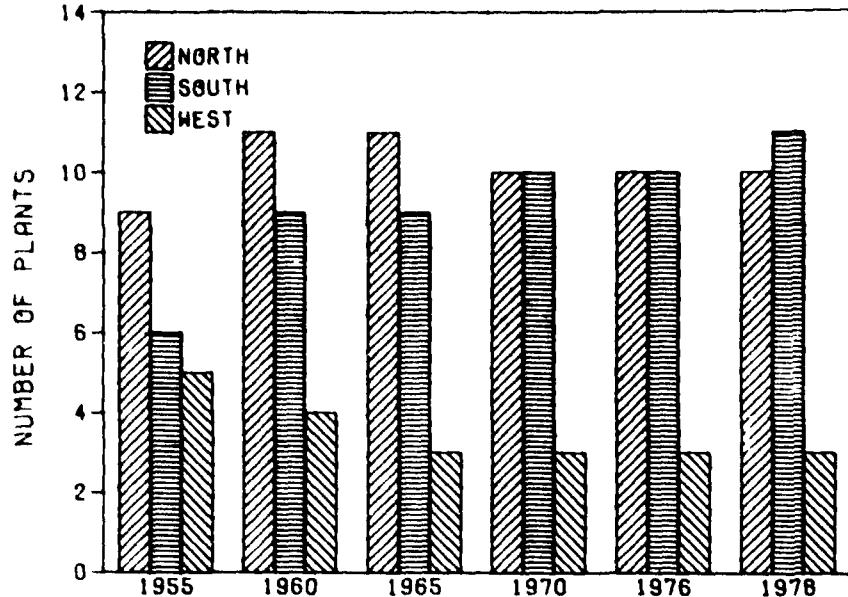
(M 148 149)



**Figure 6—Annual capacity and annual production of insulation board in the United States, 1955-1978.**

(M 148 150)

The insulation board industry, unlike the hardboard industry, has changed very little since 1955 when there were 20 active fiber-based plants having a total annual capacity of 3.0 billion square feet ( $\frac{1}{2}$ -inch basis) (table 2, figs. 1 and 5). By 1978, the number of plants had increased by only 4 to 24 and capacity increased by 50 percent to 4.5 billion square feet ( $\frac{1}{2}$ -inch basis). This capacity change represents only a 1.7 percent per year increase. Capacity growth during the 1960's was virtually stagnant, increasing only 0.71 percent per year for the decade. Average plant size increased by 35 million square feet



**Figure 7—Number of insulation board plants in the United States, by region, 1978.**

(M 148 151)

to 186 million square feet ( $\frac{1}{2}$ -inch basis) in 1978

Production of insulation board, like that of hardboard, has been traditionally below capacity except for brief periods of strong demand (fig. 6). In 1978, insulation board production of 3.3 billion square feet ( $\frac{1}{2}$ -inch basis) is expected, which represents 74 percent of industry capacity (table 5). In 1955, a strong demand for insulation board resulted in a 98 percent utilization of industry capacity. The industry reacted to this strong demand by increasing capacity 20 percent during the next 5 years only to find a weakened demand and a 79 percent utilization of capacity in 1960. Over the 23-year period, 1955 through 1978, the insulation board industry operated at an average 83 percent of capacity. Growth in production averaged only 0.5 percent per year over the 23 years. Production of insulation board in million square feet and tons per year is shown in table 6.

Individual plant locations and capacities are shown in table 4 and the map at the end of the report.

#### Regional Capacity

In 1978, over half of the Nation's insulation board capacity was located in the South. The 11 plants in the South had a combined capacity of just over 2.4 billion square feet per year ( $\frac{1}{2}$ -inch basis) (table 2 and 3, fig. 5). The North, with 10 plants, had a combined capacity

of just over 1.6 billion square feet (fig. 7). The West had only 3 insulation board plants in 1978 with a total capacity of only 350 million square feet per year ( $\frac{1}{2}$ -inch basis).

Since 1955, the South has led all regions in insulation board capacity, with the North being second and the West a distant third.

#### Projected Annual Capacity

Based on projections from the American Paper Institute (2), insulation board capacity is expected to increase by only 1,000 tons by 1980. This projected increase in capacity may not be realized due to increasing competition from foamed plastic sheathing boards. Sheathing represents approximately 65 percent of the insulation board industry's output and any major shift away from fiber-based sheathing will have dramatic adverse effects in the industry. A decrease in capacity would not be entirely unexpected.

#### Imports and Exports

Imports and exports of insulation board have been relatively small and not very important over the past 23 years. Imports rose from 9 thousand tons in 1955 and held fairly constant at approximately 35 thousand tons in the late 1960's and early 1970's (table 7). As with hardboard, imports of insulation board dropped off dramatically in the

past few years. Exports of insulation board have remained fairly constant ranging from a low of 14 to a high of 40 thousand tons in 1974.

### **Hardboard and Insulation Board Raw Material Requirements**

Woodpulp (from logs, bolts, and mill wastes) constitutes approximately 80 to 85 percent of the fibrous materials consumed in the production of hardboard and insulation board. The remaining 15 to 20 percent of fibrous materials (used primarily in insulation board production) are derived from wastepaper, bagasse, rag, straw, and other materials. The combined hardboard and insulation board production of 3.6 million tons in 1976 therefore required approximately 3 million tons of woodpulp and 0.6 million tons of wastepaper and other fibrous materials.

Based on data from the 1976 edition of Lockwood's Directory of the Paper and Allied Trades (14), nearly 75 percent of the reported volumes of woodpulp produced for manufacture into hardboard and insulation board were from the defibrated/exploded pulping process (table 8). In 1963, only 56 percent of the woodpulp consumed was from this process (15). Groundwood woodpulp accounted for 21 percent and semichemical woodpulp for 4 percent of the reported woodpulp consumption in 1976. The pulpwood equivalent of the woodpulp consumed amounted to nearly 2.6 million cords or 0.86 cords per ton of hardboard or insulation board produced. The pulpwood consumed in the manufacture of hardboard and insulation board in 1976 was approximately 3.5 percent of the total 75.8 million cords of pulpwood consumed in United States mills during that year (10).

### **Literature Cited**

1. American Hardboard Association  
1978. Company Plant Capacity Survey, 1978. American Board Products Assoc., Park Ridge, Ill.
2. American Paper Institute, Inc.  
1977. 1976-1979 Capacity: Paper, paperboard, and woodpulp. API, New York, NY.
3. American Society for Testing and Materials.  
1973. Standard definitions of terms relating to wood-base fiber and particle panel materials. ASTM Desig. D 1554-67. ASTM, Philadelphia, Pa.
4. Dickerhoof, H. Edward.  
1975. Insulation board, hardboard, and particleboard industries: past accomplishments, future problems, and opportunities. For. Prod. J. 25(4):10-16.
5. Forest Industries.  
1976. Directory of panel plants—USA. For. Ind. 103(3):122-133.
6. Forest Industries.  
1977. Directory of panel plants—USA. For. Ind. 104(3):94-112.
7. Forest Industries.  
1978. Directory of panel plants—USA. For. Ind. 105(3):106-130.
8. The Lumberman.  
1958. Lumberman's 1958 directory of board producers. The Lumberman 85(7):88-101.
9. McKeever, David B.  
1977. Woodpulp mills in the United States in 1974. USDA For. Serv. Res. Rep. FPL-1. For. Prod. Lab., Madison, Wis.
10. Phelps, Robert B.  
1977. The demand and price situation for forest products, 1976-1977. USDA For. Serv. Misc. Pub. No. 1357. U.S. Dep. Agric., Washington, D.C.
11. U.S. Department of Commerce, Bureau of the Census.  
1975. Bureau of the census. 1972 census of manufactures. Wooden Cont. and Misc. Wood Prod. MC72(2)-24C. U.S. Dep. Comm., Bur. Census, Washington, D.C.
12. U.S. Department of Commerce, Bureau of the Census.  
1977. Bureau of the census. Pulp, paper, and board. Summary for 1976 Series M26A(76)-13. U.S. Dep. Comm., Bur. Census, Washington, D.C. 19 p.
13. U.S. Department of Commerce.  
1978. Industry and trade administration. Construction Review. 24(3):50.
14. Vance Publishing Corporation.  
1978. Lockwood's directory of the paper and allied trades. Vance Publishing Corp. New York, N.Y.
15. Wright, M.G., and R.B. Phelps.  
1967. Particleboard, insulation board, and hardboard industry trends, 1956-66. USDA For. Serv. Res. Pap. WO-5. U.S. Dep. Agric., Washington, D.C.

## List of Tables

### Table

1. Uses of hardboard and insulation board in the United States, by type.
2. Number, total annual and average annual capacity of active hardboard and insulation board plants in the United States, 1955-1978.
3. Number, total annual and average annual capacity of active hardboard and insulation board plants in the United States, by region, state and type, 1978.
4. Hardboard and insulation board plants in the United States, by location, type of plant and capacity, 1978.
5. Annual capacity, annual production, and production as a percent of capacity for the hardboard and insulation board industries in the United States, 1955-1978.
6. Hardboard and insulation board production in the United States, by year, 1955-1978.
7. United States production, imports and exports of hardboard and insulation board, 1955-1978.
8. Consumption of woodpulp and pulpwood in the production of hardboard and insulation board in the United States, 1976.

**Table 1.—Uses of hardboard and insulation board in the United States, by type**

Use	Percent
<b>HARDBOARD (1972)</b>	
Prefinished paneling, including siding and wall panels	65
Dimension stock and parts, including cut to size and molded products	25
Other fabricated products	8
Perforated board	2
Total	100
<b>INSULATION BOARD (1976)</b>	
Exterior products, including sheathing, roof decking, and shingle backer	53
Interior products, including building board, wallboard, sound-deadening board, and acoustical and nonacoustical tile	34
Industrial uses	13
Total	100

Source: U.S. Department of Commerce, Bureau of the Census (11,12).

**Table 2.—Number, total annual and average annual capacity of active hardboard and insulation board plants in the United States, 1955-1978**

Year	United States			North			South			West		
	Plants	Annual capacity		Plants	Annual capacity		Plants	Annual capacity		Plants	Annual capacity	
		All plants	Average plant		All plants	Average plants		All plants	Average plant		All plants	Average plant
No.	No.		Million sq ft	No.	Million sq ft		No.	Million sq ft		No.	Million sq ft	
<b>HARDBOARD (1/8-IN. BASIS)</b>												
1955	13	2,112	163	3	610	203	1	870	870	9	632	70
1960	18	3,017	168	5	955	191	4	1,305	326	9	757	84
1965	21	3,949	188	6	1,260	210	6	1,663	277	9	1,026	114
1970	25	5,355	214	7	1,637	234	9	2,501	278	9	1,217	135
1978	28	8,284	296	7	2,506	358	11	3,997	363	10	1,781	178
<b>INSULATION BOARD (1/4-IN. BASIS)</b>												
1955	'20	2,803	148	'9	857	107	6	1,441	240	5	505	101
1960	'24	3,407	148	'11	1,013	101	9	1,989	221	4	405	101
1965	'23	3,547	161	'11	1,130	113	9	2,123	236	3	294	98
1970	'23	3,673	167	'10	1,165	129	10	2,210	221	3	298	99
1978	'23	3,999	190	'10	1,318	146	'11	2,451	245	2	230	115

<sup>a</sup>Includes 1 active plant with capacity unknown; excluded from calculation of average plant capacity.

<sup>b</sup>Includes 2 active plants with capacity unknown; excluded from calculation of average plant capacity.

Sources: Selected issues of *Forest Industries*, *Lockwood's Directory of the Paper and Allied Trades*, and *The Lumberman*.

**U.S. Forest Products Laboratory.**

Hardboard and insulation board plants in the United States - Capacity, production, and raw material requirements, 1955-1978, by David B. McKeever, Madison, Wis., For. Prod. Lab., 1979.  
12 p. (USDA For Serv. Res. Bull. FPL 7).

Estimates of plant capacities for hardboard and insulation board plants in the United States in 1978 are provided. The location, type and estimated capacity of each plant is enumerated. Industry capacity and production for specific years are compared. Also reported are imports and exports from 1955 and raw material requirements in 1976.

**U.S. Forest Products Laboratory.**

Hardboard and insulation board plants in the United States - Capacity, production, and raw material requirements, 1955-1978, by David B. McKeever, Madison, Wis., For. Prod. Lab., 1979.  
12 p. (USDA For Serv. Res. Bull. FPL 7).

Estimates of plant capacities for hardboard and insulation board plants in the United States in 1978 are provided. The location, type and estimated capacity of each plant is enumerated. Industry capacity and production for specific years are compared. Also reported are imports and exports from 1955 and raw material requirements in 1976.

**U.S. Forest Products Laboratory.**

Hardboard and insulation board plants in the United States - Capacity, production, and raw material requirements, 1955-1978, by David B. McKeever, Madison, Wis., For. Prod. Lab., 1979.  
12 p. (USDA For Serv. Res. Bull. FPL 7).

Estimates of plant capacities for hardboard and insulation board plants in the United States in 1978 are provided. The location, type and estimated capacity of each plant is enumerated. Industry capacity and production for specific years are compared. Also reported are imports and exports from 1955 and raw material requirements in 1976.

**U.S. Forest Products Laboratory.**

Hardboard and insulation board plants in the United States - Capacity, production, and raw material requirements, 1955-1978, by David B. McKeever, Madison, Wis., For. Prod. Lab., 1979.  
12 p. (USDA For Serv. Res. Bull. FPL 7).

Estimates of plant capacities for hardboard and insulation board plants in the United States in 1978 are provided. The location, type and estimated capacity of each plant is enumerated. Industry capacity and production for specific years are compared. Also reported are imports and exports from 1955 and raw material requirements in 1976.

COM 1-1, 1-3

**U.S. Forest Products Laboratory.**

Hardboard and insulation board plants in the United States - Capacity, production, and raw material requirements, 1955-1978, by David B. McKeever, Madison, Wis., For. Prod. Lab., 1979.  
12 p. (USDA For Serv. Res. Bull. FPL 7).

Estimates of plant capacities for hardboard and insulation board plants in the United States in 1978 are provided. The location, type and estimated capacity of each plant is enumerated. Industry capacity and production for specific years are compared. Also reported are imports and exports from 1955 and raw material requirements in 1976.

**Table 3.—Number, total annual and average annual capacity of active hardboard and insulation board plants in the United States, by region, state, and type, 1976**

Region and state	Hardboard ( $\frac{1}{8}$ -in. basis)			Insulation board ( $\frac{1}{4}$ -in. basis)		
	Plants	Annual capacity		Plants	Annual capacity	
		All plants	Average plant		All plants	Average plant
	No.	Million sq ft		No.	Million sq ft	
<b>North</b>						
Iowa	0	0.0	0.0	1	150.0	150.0
Maine	0	.0	.0	1	125.0	125.0
Michigan	1	528.4	528.4	1	155.0	155.0
Minnesota	3	1,182.0	394.0	2	290.0	290.0
Missouri	0	.0	.0	1	55.0	55.0
New Jersey	0	.0	.0	1	125.0	125.0
New York	0	.0	.0	1	160.0	160.0
Pennsylvania	1	550.0	550.0	1	200.0	200.0
Rhode Island	0	.0	.0	1	58.0	58.0
Wisconsin	2	245.6	122.8	0	.0	.0
<b>Total</b>	<b>7</b>	<b>2,506.0</b>	<b>358.0</b>	<b>9</b>	<b>1,318.0</b>	<b>146.0</b>
<b>South</b>						
Alabama	0	.0	.0	1	188.0	188.0
Arkansas	1	144.0	144.0	0	.0	.0
Florida	0	.0	.0	1	120.0	120.0
Georgia	0	.0	.0	1	570.0	570.0
Louisiana	0	.0	.0	1	470.0	470.0
Mississippi	2	1,940.0	970.0	2	265.0	132.5
North Carolina	2	523.0	261.5	1	140.0	140.0
Oklahoma	1	175.0	175.0	1	218.0	218.0
South Carolina	1	229.0	229.0	0	.0	.0
Tennessee	1	180.0	180.0	0	.0	.0
Texas	1	266.0	266.0	1	230.0	230.0
Virginia	2	540.0	270.0	2	250.0	250.0
<b>Total</b>	<b>11</b>	<b>3,997.0</b>	<b>363.4</b>	<b>11</b>	<b>2,451.0</b>	<b>245.1</b>
<b>West</b>						
California	2	705.0	352.5	0	.0	.0
Oregon	7	1,026.1	146.6	2	230.0	115.0
Washington	1	50.0	50.0	0	.0	.0
<b>Total</b>	<b>10</b>	<b>1,781.1</b>	<b>178.1</b>	<b>2</b>	<b>230.0</b>	<b>115.0</b>
<b>United States</b>	<b>28</b>	<b>8,284.1</b>	<b>295.9</b>	<b>23</b>	<b>3,999.0</b>	<b>190.4</b>

<sup>a</sup>Includes 1 active plant with capacity unknown; excluded from calculation of average plant capacity.

<sup>b</sup>Includes 2 active plants with capacity unknown; excluded from calculation of average plant capacity.

**Table 4.—Hardboard and insulation board plants in the United States, by location, type of plant, and capacity, 1978**

Plant No. <sup>1</sup>	Plant name	Plant location	Annual capacity			
			Hardboard ( $\frac{1}{4}$ -in. basis)	Insulation board ( $\frac{1}{2}$ -in. basis)		
Million sq ft						
<b>North</b>						
Iowa:						
1	Celotex Corp.	Dubuque	—	<sup>2</sup> 150.0		
Maine:						
2	U.S. Gypsum Co.	Lisbon Falls	—	<sup>2</sup> 125.0		
Michigan:						
3	Abitibi Corp.	Alpena	528.4	—		
4	Celotex Corp.	L'Anse	—	155.0		
Minnesota:						
5	Boise Cascade Corp.	International Falls	<sup>3</sup> 690.0	—		
6	Conwed Corp.	Cloquet	—	<sup>2</sup> 290.0		
7	Superwood Corp.	Bemidji	96.0	—		
8	Superwood Corp.	Duluth	396.0	—		
Missouri:						
9	Huebert Fiberboard Inc.	Boonville	—	55.0		
New Jersey:						
10	Homasote Co.	Trenton	—	125.0		
New York:						
11	Upson Co.	Lockport	—	<sup>4</sup> 160.0		
Pennsylvania:						
12	Celotex Corp.	Sunbury	—	200.0		
13	Masonite Corp.	Towanda	550.0	—		
Rhode Island:						
14	Bird & Son	Phillipsdale	—	<sup>4</sup> 58.0		
Wisconsin:						
15	Boise Cascade Corp.	Phillips	77.6	—		
16	Superior Fiber Products Inc.	Superior	168.0	—		
	Total, North		2,506.0	1,318.0		
<b>South</b>						
Alabama:						
17	National Gypsum Co.	Mobile	—	188.0		
Arkansas:						
18	Superwood Corp.	N. Little Rock	144.0	—		
Florida:						
19	Abitibi Corp.	Blountstown	—	<sup>2</sup> 120.0		
Georgia:						
20	Armstrong Cork Co.	Macon	—	<sup>4</sup> 570.0		
Louisiana:						
21	Celotex Corp.	Marrero	—	<sup>2</sup> 470.0		
Mississippi:						
22	Flintkote Co.	Meridian	—	220.0		
23	Masonite Corp.	Laurel	1,850.0	—		
24	U.S. Gypsum Co.	Greenville	90.0	45.0		

**Table 4.—Hardboard and insulation board plants in the United States, by location, type of plant, and capacity, 1978 cont.**

Plant No	Plant name	Plant location	Annual capacity	
			Hardboard ( $\frac{1}{2}$ -in basis)	Insulation board ( $\frac{1}{2}$ -in basis)
Million sq ft				
	North Carolina			
25	Abitibi Corp	Roaring River	315.0	140.0
26	Georgia Pacific Corp	Conway	208.0	—
	Oklahoma			
27	Weyerhaeuser Co	Broken Bow	175.0	218.0
	South Carolina			
28	Champion International	Catawba	229.0	—
	Tennessee			
29	Celotex Corp	Paris	180.0	—
	Texas			
30	Temple Eastex Inc	Diboll	266.0	230.0
	Virginia			
31	Georgia Pacific Corp.	Jarratt	—	250.0
32	U.S. Gypsum Co.	Danville	250.0	3.0
33	Weyerhaeuser Co.	Doswell	315.0	—
	Total, South		3,997.0	2,451.0
<b>West</b>				
	California			
34	Louisiana-Pacific Corp.	Oroville	145.0	—
35	Masonite Corp.	Ukiah	560.0	—
	Oregon			
36	Champion International	Hood River	76.0	—
37	Champion International	Lebanon	107.0	—
38	Evans Products Co.	Corvallis	120.0	—
39	Georgia-Pacific Corp.	Coos Bay	252.0	—
40	Kaiser Gypsum Co., Inc.	St. Helens	150.0	—
41	Stimson Lumber Co.	Forest Grove	114.1	—
42	U.S. Gypsum Co.	Pilot Rock	31.0	280.0
43	Weyerhaeuser Co.	Klamath Falls	326.0	—
	Washington			
44	Publishers Forest Products Co.	Anacortes	50.0	—
	Total, West		1,781.1	230.0

\*Plant number refers to location on capacity map at end of report.

<sup>a</sup>Forest Industries, March 1977 (6).

<sup>b</sup>Capacity combined at this location.

<sup>c</sup>Lockwood's Directory of the Paper and Allied Trades, 1978 (14).

<sup>d</sup>USDA Forest Service estimate.

<sup>e</sup>Forest Industries, March 1976 (5).

Source: Hardboard—American Hardboard Association, 1978 (1); Insulation board—Forest Industries, March 1978 (7); exceptions as noted.

**Table 5.—Annual capacity, annual production and production as a percent of capacity for the hardboard and insulation board industries in the United States, 1955-1978**

Year	Annual capacity	Annual production	Production as a percent of capacity
—Million sq ft—			
HARDBOARD (1/8-IN. BASIS)			
1955	2,112	1,470	70
1960	3,017	1,930	64
1965	3,949	2,917	74
1970	5,355	4,340	81
1978	8,284	7,200	87
INSULATION BOARD (1/2-IN. BASIS)			
1955	2,803	2,949	105
1960	23,407	2,848	84
1965	23,547	3,362	95
1970	23,673	3,194	87
1978	23,999	3,300	83

<sup>1</sup>Includes a small, unknown quantity of medium-density fiberboard production.

<sup>2</sup>Includes 1 plant with capacity unknown.

<sup>3</sup>Includes 2 plants with capacity unknown.

**Table 6.—Hardboard and insulation board production in the United States, by year, 1955-1978**

Year	Hardboard <sup>1</sup> (1/8-in. basis)		Insulation board (1/2-in. basis)	
	Thousand tons	Million sq ft	Thousand tons	Million sq ft
1955	530	1,470	1,093	2,949
1956	540	1,497	1,102	2,973
1957	569	1,556	989	2,679
1958	609	1,693	1,057	2,884
1959	734	2,021	1,171	3,114
1960	686	1,930	1,098	2,848
1961	762	2,154	1,084	2,850
1962	865	2,510	1,080	2,885
1963	959	2,709	1,139	3,039
1964	1,050	2,867	1,215	3,262
1965	1,093	2,917	1,259	3,362
1966	1,089	3,089	1,155	3,079
1967	1,074	3,002	1,176	3,209
1968	1,282	3,693	1,133	3,476
1969	1,421	4,182	1,352	3,623
1970	1,463	4,340	1,219	3,194
1971	1,718	5,126	1,446	3,839
1972	1,908	5,671	1,529	3,918
1973	2,001	6,049	1,547	3,914
1974	1,978	5,845	1,295	3,282
1975	1,823	5,201	1,205	2,856
1976	2,145	6,125	1,441	3,407
1977	2,279	6,508	1,409	3,331
<sup>2</sup> 1978	2,500	7,200	1,400	3,300

<sup>1</sup>Includes a small, unknown quantity of medium-density fiberboard production for 1966 through 1974.

<sup>2</sup>Preliminary, USDA Forest Service estimate.

Sources: *The Lumberman* (6).

U.S. Department of Commerce, Bureau of the Census (12).

U.S. Department of Commerce, Industry and Trade Administration (13).

Wright, Maurice G., and Robert B. Phelps (15).

**Table 7.—United States production, imports and exports of hardboard and insulation board, 1955-1978**

Year	Hardboard <sup>a</sup>			Insulation board		
	United States production	Imports	Exports	United States production	Imports	Exports
—Thousand tons—						
1955	530	55	6	1,093	9	20
1956	540	76	7	1,102	11	22
1957	569	72	7	989	6	20
1958	609	70	6	1,057	9	14
1959	734	117	6	1,171	15	14
1960	686	94	6	1,098	12	14
1961	762	100	6	1,084	9	16
1962	865	128	6	1,080	15	16
1963	959	161	8	1,139	22	19
1964	1,050	190	11	1,215	23	19
1965	1,093	221	13	1,259	23	19
1966	1,089	163	16	1,155	24	18
1967	1,074	163	15	1,176	25	16
1968	1,282	217	18	1,133	36	17
1969	1,421	238	21	1,352	34	24
1970	1,463	156	26	1,219	35	19
1971	1,718	219	28	1,446	35	25
1972	1,908	369	34	1,529	35	26
1973	2,001	367	43	1,547	34	31
1974	1,978	262	59	1,295	17	40
1975	1,823	95	55	1,205	13	32
1976	2,145	185	75	1,441	15	35
1977	2,279	232	59	1,409	21	34
1978	2,500	250	55	1,400	20	35

<sup>a</sup>Includes a small, unknown quantity of medium-density fiberboard production for 1966 through 1974.

Preliminary, USDA Forest Service estimate.

Sources: *The Lumberman*, July 1958 (8)  
 Phelps, Robert B. (10)  
 Wright, Maurice G., and Robert B. Phelps (15)  
 U.S. Department of Commerce, Bureau of the Census (12)

**Table 8.—Consumption of woodpulp and pulpwood in the production of hardboard and insulation board in the United States, 1976**

Woodpulp type	Percent of woodpulp type consumed in board production	Equivalent volume consumed	Pulpwood consumption per ton of woodpulp produced <sup>a</sup>		Total pulpwood consumption
			Thousand tons	Cord	
Groundwood	20	600	0.94		564
Debrinated/ exploded	75	2,250	.83		1,868
Semicchemical	5	150	1.02		153
Total	100	3,000	—		2,585

<sup>a</sup>Factors based on data for 1974.

Sources: Lockwood's Directory of the Paper and Allied Trades (14)  
 McKeever, David B. (9)  
 Phelps, Robert B. (10)

## **Acknowledgment**

Appreciation is expressed to Mr James E. Nolan of the American Hardboard Association for his advice and assistance throughout the course of this study

